**Claims:**

1. A method of transmitting an information-bearing optical signal along an optical communication system that includes a transmitting terminal, a receiving terminal, and an optical transmission path optically coupling the transmitting and receiving terminals and having at least one rare-earth doped optical amplifier therein, said method comprising the steps of:

a. receiving the information-bearing optical signal from the transmitting terminal;

b. supplying Raman gain to the optical signal in a first portion of the optical transmission path; and

c. subsequent to step (b), forwarding the optical signal to a first of said at least one rare-earth doped optical amplifier;

d. after an increase in optical loss in the first portion of the optical transmission path arising from performance of a cable repair thereto, increasing the Raman gain supplied to the optical signal in step (b) to overcome at least a portion of said increase in optical loss.

2. The method of claim 1, further comprising the steps of:

e. receiving the information-bearing optical signal from one of said at least one rare-earth doped optical amplifier;

f. supplying Raman gain to the optical signal received in step (e); and

g. subsequent to step (e), forwarding the optical signal to the receiving terminal.

3. The method of claim 1 wherein the step of supplying gain includes the step of supplying Raman gain having a gain profile with a positive gain tilt over a signal waveband.

4. The method of claim 1, wherein said at least one rare-earth doped optical amplifier comprises a plurality of rare-earth doped optical amplifiers spaced apart from one another along the transmission path by a given distance, said given distance being

less than a distance along the transmission path between the transmitting terminal and a length of said first portion of the transmission path in which Raman gain is provided.

5. The method of claim 1, wherein the step of supplying Raman gain includes the step of supplying pump energy co-propagating with the signal.

6. The method of claim 5, wherein the pump energy is supplied from the transmitting terminal.

7. The method of claim 2, wherein the step of supplying Raman gain to the optical signal received in step (e) includes the step of supplying pump energy counter-propagating with the signal.

8. The method of claim 7, wherein the counter-propagating pump is supplied from the receiving terminal.

9. A method of transmitting an information-bearing optical signal along an optical communication system that includes a transmitting terminal, a receiving terminal, and an optical transmission path optically coupling the transmitting and receiving terminals and having a plurality of repeater-based optical amplifiers spaced apart from one another along the transmission path by a given distance, said method comprising the steps of:

a. receiving the information-bearing optical signal from the transmitting terminal;

b. supplying Raman gain to the optical signal in a first portion of the optical transmission path; and

c. subsequent to step (b), forwarding the optical signal to a first of said plurality of repeater-based optical amplifiers, wherein said given distance is less than a distance along the transmission path between the transmitting terminal and a length of said first portion of the transmission path in which Raman gain is provided;

d. after an increase in optical loss in the first portion of the optical transmission path arising from performance of a cable repair thereto, increasing the

Raman gain supplied to the optical signal in step (b) to overcome at least a portion of said increase in optical loss.

10. The method of claim 9, further comprising the steps of:

e. receiving the information-bearing optical signal from one of said plurality of optical amplifiers;

f. supplying Raman gain to the optical signal received in step (e); and

g. subsequent to step (f), forwarding the optical signal to the receiving terminal.

11. The method of claim 9 wherein the step of supplying gain includes the step of supplying Raman gain having a gain profile with a positive gain tilt over a signal waveband.

12. The method of claim 9, wherein the step of supplying Raman gain includes the step of supplying pump energy co-propagating with the signal.

13. The method of claim 12, wherein the pump energy is supplied from the transmitting terminal.

14. The method of claim 10, wherein the step of supplying Raman gain to the optical signal received in step (e) includes the step of supplying pump energy counter-propagating with the signal.

15. The method of claim 14, wherein the counter-propagating pump is supplied from the receiving terminal.

16. The method of claim 9, wherein the plurality of repeater-based optical amplifiers is a plurality of rare-earth doped optical amplifiers.

17. The method of claim 10, wherein the plurality of repeater-based optical amplifiers is a plurality of rare-earth doped optical amplifiers.

18. The method of claim 16, wherein the rare-earth doped optical amplifiers are erbium-doped optical amplifiers.

19. The method of claim 17, wherein the rare-earth doped optical amplifiers are erbium-doped optical amplifiers.

20. In an optical communication system that includes a transmitting terminal, a receiving terminal, and an optical transmission path optically coupling the transmitting and receiving terminals and having a plurality of optical amplifiers spaced apart from one another along the transmission path by a given distance, a Raman optical amplifier comprising:

a first portion of the optical transmission path having a first end coupled to the transmitting terminal and a second end coupled to a first of the plurality of optical amplifiers; and

a pump source providing pump energy to said first portion of the optical transmission path at one or more wavelengths less than a signal wavelength to provide Raman gain in the first portion at the signal wavelength, said given distance being less than a length of said first portion of the transmission path in which Raman gain is provided; and

means for increasing the pump energy provided by the pump source after an increase in optical loss in said first portion of the optical transmission path.

21. In the optical communication system of claim 20, a second Raman optical amplifier comprising:

a second portion of the optical transmission path having a first end coupled to the receiving terminal and a second end coupled to one of the plurality of optical amplifiers; and

a second pump source providing pump energy to said second portion of the optical transmission path at one or more wavelengths less than a signal wavelength to provide Raman gain in the second portion at the signal wavelength;

means for increasing the pump energy provided by the second pump source after an increase in optical loss in said second portion of the optical transmission path.

22. In the optical communication system of claim 20, wherein said pump source provides Raman gain having a gain profile over a signal waveband with a positive gain tilt.

23. In the optical communication system of claim 20, wherein the Raman gain is less than that required to supply a signal saturating the first optical amplifier.

24. In the optical communication system of claim 21, wherein the plurality of optical amplifiers is a plurality of rare-earth doped optical amplifiers.

25. In the optical communication system of claim 22, wherein the plurality of optical amplifiers is a plurality of rare-earth doped optical amplifiers.

26. In the optical communication system of claim 23, wherein the plurality of optical amplifiers is a plurality of rare-earth doped optical amplifiers.

27. In the optical communication system of claim 24, wherein the rare-earth doped optical amplifiers are erbium-doped optical amplifiers.

28. In the optical communication system of claim 25, wherein the rare-earth doped optical amplifiers are erbium-doped optical amplifiers.

29. In the optical communication system of claim 26, wherein the rare-earth doped optical amplifiers are erbium-doped optical amplifiers.

30. In the optical communication system of claim 20, wherein the plurality of optical amplifiers are a plurality of Raman optical amplifiers.

31. In the optical communication system of claim 21, wherein the pump source is arranged to provide pump energy co-propagating with a signal.

32. In the optical communication system of claim 31, wherein the pump source is co-located with the transmitting terminal.

33. In the optical communication system of claim 21, wherein the second pump source is arranged to provide pump energy counter-propagating with the signal.

34. In the optical communication system of claim 33, wherein the second pump source is co-located with the receiving terminal.